DOCUMENT RESUME

ED 039 005 LI 001 932

AUTHOR	Clemens, Thomas
TITLE	Information Transfer and Research Utilization in Education.
INSTITUTION	Michigan State Dept. of Education, Lansing.
PUB DATE	Oct 69
NOTE	24p.; Edited transcript of an address before the staff of the Michigan Department of Education, July 14, 1969
EDRS PRICE	EDRS Price MF-$0.25 HC-$1.30
DESCRIPTORS	Educational Resources, *Educational Specifications, *Information Needs, *Information Networks, *Information Services, Information Sources, *Information Systems

ABSTRACT

An evaluation of what comprises an effective educational information system, where we now stand with regard to such systems, and how we can improve these systems so that they are usable for educational decision makers and practitioners at all levels. The needs for a multi-level information system, interpersonal communication "a warm and walking computer terminal," tailoring of information to the users' requirements, and information sources that are extremely accessible to the user are stressed. A survey of teachers and principals indicated what respondents want from an information system is: (1) accessible information, (2) current and comprehensive information, (3) rapid response to queries, (4) verification of reliability and (5) flexible products and flexible services. (MF)

ED039005

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

INFORMATION TRANSFER AND RESEARCH

UTILIZATION IN EDUCATION

the edited transcript of an address given by

THOMAS CLEMENS, Chief
Research Utilization Branch
United States Office of Education

before the staff of the

Michigan Department of Education
July 14, 1969

LT 001932

MICHIGAN DEPARTMENT OF EDUCATION
October, 1969

Information Transfer and Research Utilization in Education

Thomas Clemens, Chief, Research Utilization Branch
United States Office of Education

Today I should like to talk with you about four questions. First of all: Why information systems in education?; Why do we need them or why might people want them? Secondly: What comprises an effective educational information system? Third: Where do we now stand with regard to such systems? Fourth: How can we go about improving these systems so that they are usable for educational decision makers and practitioners at all levels?

Perhaps the most used and abused word in education today is innovation. The relationship of information use to innovative programs, I assume, is obvious. It's surprising, however, how many presumably innovative programs around the country in education in the past few years have had no verifiable knowledge base whatsoever. They have been innovations,or inventions, right off the top of the head, growing out of intuition. Such inventions, of course, are fine, but I think that for most of us, and most school districts and state agencies, it is important to make sure that our flash of insight is somehow or other verified against evidence from other sources. So, one area where an information system can make a contribution, is in planning programs to change schools. There are other uses too, however, and I'll try to elaborate on these a little. Let's look at knowledge utilization in two ways: first of all, from the standpoint of information using behavior among educators, and secondly in terms of possible benefits of such use to educational organizations.

From a behavioral standpoint, let's consider what evidence is available about how educators use information, why they ask for it, and, presumably, why they use it. I suppose it comes as no surprise to anyone that one of the most frequent uses of objective, scientific information by decision makers and practitioners in education is to justify what they are already doing. This is something that a lot of people shake their heads over. However, it seems to me that if you're going to justify what you're doing by any means, it is better to do it with information, rather than rhetoric or doctrine or something else of this sort. There are, though, other uses as well. Secondly, every teacher uses information to complete everyday tasks. Insofar as we can provide the teacher needed information, in a systematized and updated way, we can facilitate this completion of day-to-day tasks. Third, we can use it to decide how well we're doing, where we stand. A knowledge base provides the basis for a start on evaluation in education. Fourth, information, by changing our conceptual views of education, can help us to define educational problems/and needs more precisely, more clearly, and more operationally. Of course, it can also facilitate decision making. Clearly, a decision based upon information is something greatly to be desired, although very frequently the knowledge base upon which educational decisions are made is pretty narrow as we all know. Finally, having made a new decision, information systems can help to implement it, through drawing upon the experience gained in other settings. What we can say, then, as to the why of using formal information systems in education is that they can help us to define problems and make decision; to implement decisions; to carry on our every day operations, whether we are changing from previous behavior or not; and, finally, as a basis for evaluation. Now, enough on that; let's talk a little bit about what it is that comprises an effective education information system.

We have a lot less information on effective information systems in education than we might like, but we do have two bodies of literature which can be of benefit in defining requirements of information systems. First of all, there is the so-called diffusion of innovations literature, which is concerned with adoption of new practices and inventions; secondly, we have the literature on information science. Let me draw on some of this literature, and later, as best I can, relate it to conditions and constraints in education, plus what we know about information utilization in education itself.

Everett Rogers of Michigan State University, in his book Diffusion of Innovations, describes the process of adopting innovations as a special kind of decision making. He says that when a person makes a rational decision to adopt something new or different, he goes through a number of stages. You rarely find any of these stages skipped if a decision to change is made. The initial stage (hardly surprising) is awareness that some alternative to current practice exists. Having become aware, a cosmopolite, motivated person will demonstrate interest in the innovation by trying to get more specialized information about the topic. Having had his interest answered with more information, he then engages in a kind of an in-the-head evaluation of whether this new phenomenon relates to him, whether it promises higher rewards than his current practice, the problems he lives with, and so forth. If the answer to this evaluation is favorable, he is likely then to go through a period of trial of the innovation on a limited scale to see whether the innovation does indeed work for him. Another purpose of the trial period is to allow necessary adoptation of the innovation to the local setting. Finally, if the trial is successful, the rational innovator then adopts; e.g., he goes ahead and makes use of the innovation on a continuing operating basis until it's replaced by something better. Now, the

interesting thing is that as the person is going through this adoption process, he uses different information sources at every stage in the adoption process. Normally, particularly for the early adoptors, awareness comes from mass-media--from technical reports perhaps, and from the kinds of testamonials about new practices that characterize much writing about education in newspapers and magazines. When he gets to the point where he is interest and wants to know more, the potential adopter is not satisfied with the kind of superficial information found in such testamonials. He now wants materials which interpret what the innovation is about in some detail and the situations in which it has been tried. He very well may not be satisfied with just receiving news clippings or a bibliography, but this is more likely to be true if he is a fairly cosmopolitan person who goes to original information sources. For the less cosmopolite adopter, personal two-way communication with an earlier adopter is more likely to provide the most relevant response to his interest.

When the adopter gets to the valuation stage, he relies heavily on interpersonal communication; he will go to the people who have tried it, who have lived with the problem. As Rogers puts it, during the pre-trial evaluation adopters are more likely to believe people than documents. The result is that in medical, agricultural, and particularly educational settings, there is a heavy reliance on interpersonal communication during the pre-trial evaluation stage. During the trial and adoption stages, we find ever-increasing emphasis on interpersonal contacts and communication. There is some recent evidence, however, that certain kinds of specialized, interpretive material can be of help at this stage in getting people to make whatever is the right decision for them, and in many cases that the right decision is to reject rather than to adopt an innovation. This then is how the diffusion researchers look at the use of information and information sources in making decision to change.

Let's now look at evidence provided us by information scientists, and see how science-oriented practitioners and scientists themselves seek out information. A useful source of information is Herbert Menzel of Columbia University, whose investigations have resulted in one of the seminal articles in the field of information science.[1] In this article he identifies a variety of different approaches to decision making, or to information gathering, by both scientists and technologists. Note that this relates at least to some degree to what was said earlier about how teachers and administrators seek out information. The first pattern is what Menzel calls the current approach, in which the information seeker attempts to stay up to date in a field in which he is already competent. The information systems developments, techniques, and products which are responsive to this current approach are called current awareness searches, Selective Dissemination of Information, and a lot of other jargon which we shall not go into at this time. Secondly, Menzel has described what he calls the everyday approach. An example is the engineer who doesn't clutter up his mind trying to remember the boiling point of lead under certain conditions, but uses a handbook for this. We might point out, that the teacher also uses this kind of everyday approach, when she looks at the cumulative record of a student at the beginning of the year, or when she attempts to draw on additional sets of information in order to make a decision about how to deal with this class or this particular youngster regarding some instructional or other classroom problem. Again, this process requires a different kind of information from simply the current awareness where you're trying to tap everything coming out as it comes out. Third, there is what Menzel calls the exhaustive approach. Here again, a

---

[1] Menzel, Herbert. "Types of Information Seeking," Library Quarterly, Vol. 34 (1964).

person who is competent in a given area, before starting some new and presumably major project, attempts to find out everything he can that relates to this particular problem in his field. I guess one of the closest examples you'll find of this in education, is somebody writing a proposal for a Title III project, although I am sure that there are other examples of program planning at the school board level and elsewhere. The fourth approach is what he calls the brush-up approach. This is where the individual attempts to collect information in an area where he is not highly knowledgeable. If, for example, you have an information scientist who is trying to learn what to do about an educational information system, he knows information science, but he has to learn very quickly and very efficiently about the problem of what this subculture we call education is in the United States. Again, I think you may infer that the brush-up approach leads to a need for different kinds of information and information products than those required for other purposes. Finally, Menzel describes the browsing approach, in which, on a more or less random basis, one skims through catalogues or indexes of journals, or other sources outside of one's pre-determined field of interest. It is in this area, of course, where big flashes of insight occur sometimes, and where inventive persons see two things fitting together which they never really thought about fitting together before. There is one other thing that I think I ought to point out here, an insight provided by William J. Paisley of Stanford; communication of information occurs in two different dimensions. One is Paisley calls horizontal communication, in which information is communicated at essentially the same level of expertise as that at which it was orginated. Horizontal communication is the kind that occures in professional associations, for example, where two learning psychologists will keep in touch about each others research. They are at the same level of expertise and they are sharing scientific information. The other kind

of communiation, which is of particular importance to us here today, is what Paisley calls vertical communication, where information is transmitted from one level of expertise to another, usually from a higher to a lower level. A good example of this would be where the pharmaceutical industry is working with biochemists and others to develop certain kinds of information and guidelines with regard to a new drug, and may communicate this through the physician who is at a lower level of expertise in pharmacology and bio-medical science. The same thing, I think, applies in education, where we have highly structured vertical communication channels. One of the problems in talking about communication in education is that we often assume that the educational scientist/researcher is necessarily more expert than the educational practitioner with regard to any problem related to education. I think we all have seen instances, however, where it would be useful if we could educate the educational psychologist or educational sociologist about what it is really like in the classroom. So we have some kind of need for two-way vertical communication in education.

From these points, I would like to suggest that there are a number of generalizations we can draw about information systems. First of all, if an information system is to work, and to be effective and useful for people, it will have to provide a variety of different forms of information. You can't be satisfied with just research reports, or with progress reports or bibliographic listings, or interpretations, alone--you must have a variety of information products. This is true because, first of all, in a complex field like education, there are many different educational roles, and the people in these different roles need different forms of information to perform their jobs. Secondly, even within a given role, the superintendency, for instance, the role incumbent performs not just one, but a number of functions. The superintendent

is not just a decision-maker, he performs other managerial functions as well, so he needs different information for different functions he performs. Similarly, the teacher is not always a practitioner, or clinician, but is sometimes a decision maker; she will need different kinds of information for each of the functions she fulfills. Furthermore, each of these people will need different forms of information for different stages in their professional development. If one is at the interest stage in the Rogers paradigm for example, one needs one kind of information, which is certainly different from the information and information formats needed when actually trying out some innovative programs.

Another generalization is that information sources must be extremely accessible to the user. User studies in the information science field have repeatly shown that the first information source used and the most frequently used information source is the one which is closest at hand to the user; and hold on now--<u>even when the user does not think it is very good</u>. Bad information will drive out good information, if good information is inaccessible. Also, as you may have inferred from some of my comments, inter-personal communication is vitally important both for the practice-oriented and the research oriented person. It has been said that, "if you're going to have a computerized information system, the computer terminal had better be warm and walking." People learn more from other people than from objective sources because interpersonal communication permits adoption of the message to the user's prior knowledge and needs in a way that simply scanning documents does not. And finally, there is a phenomenon that some people call user apathy, Paisley calls it user nonchalance, which means that most people simply are not going to try to use information sources unless they are readily accessible. I would suggest--well, I'll talk about user apathy with regard to education a little later--but simply

because you have a good information system, doesn't mean that it is going to be used. You're going to have to work aggressively to make sure that people do use verifiable information in making decisions. Let's try to relate this more closely to education. Most of the information science literature grows out of big information systems like the Defense Documentation Center, the NASA Data Bank, and similiar facilities. In those kinds of information systems, there is very clearly a reward system for using information because information can be translated into new inventions and products which mean profits for the people who use the information. Similarly, the physician and the farmer use information, because information means more yield per acre, shorter treatment time, or whatever. Our problem in education, of course, is that our reward system is not clearly related to productivity in the sense that reward systems in other fields are. What is the payoff for doing things differently or better in education? It depends upon the setting, but by and large, I would submit that it is harder to identify relative advantage and payoff with information use in education than in agriculture, medicine, or in industry. Put another way, education has had a fairly limited scientific tradition, our roots are much deeper in the humanistic tradition than in the scientific tradition. Remember, just about 70 years ago the first real educational experiment was run. This was Rice's study on spelling and he was sneered at when he reported that he had tried out two different ways to teach spelling, and it was clear that the kinds could learn more with one method than with the other. The reaction of the educational community was, "whatever made you think that you could decide how well children spell by observing their spelling behavior?" Presumably, disputation or something else was the favored mode of solving educational problems. Some of this is still with us today, although to a lesser degree. If you'd look into some of Philip Jackson's work here in the state of Michigan on value systems

and rewards for teachers, you find that teachers just don't trust objective information very much at present. They believe that a testing program, for example, is something that is imposed by somebody else, for the values or benefits unrelated to teachers or pupils. They don't see objective measurement as a tool of use to them; so I would suggest that one of our problems in an educational information system is that our scientific tradition is much more shallowly rooted, and much narrower than some other fields.

Another problem, of course, in trying to use information in education is that we have a very wide range of goals and some of these goals are conflicting. I came from a part of the Midwest where one of the biggest impediments to school district reorganization was that we would lose our basketball teams if we reorganized, despite the face that there were strong cases made that youngsters would learn more in the reorganized school district. I would suggest that in education there is almost excessive reliance on interpersonal communication. Some of the studies done by the Far West Laboratory for Educational Research and Development, and others, have indicated that virtually the only source of information used in some Title III projects by the person writing the proposal has been other people who are trying the same kind of thing. Visitation and inter-personal communication is sometimes used to the exclusion of any documentary or reproducible evidence about a given kind of innovation that a Title III center is trying to implement. Yes, we have information user apathy in education. If user apathy were a disease, there would be two major syndromes in education. The first syndrome is the "Don't confuse me with the facts" syndrome, which characterizes, frequently, the administrator or practitioner who is afraid that if he gets information that goes counter to what he is doing, he'll be expected to change. The other syndrome in this dread disease of information apathy is the, "Please mother, I'd rather do it myself," syndrome.

This second syndrome is frequently found in the innovative educator and certainly in the educational researcher, who would much rather replicate an experiment or domonstration than find out whether it has worked some place else. This phenomenon happens time, after time, after time. If you don't believe it, look in Pacesetters at the number of redundant programs that are going on, even in one state, under Title III, which have already been losers in other places at other times.

What does this all imply so far as the requirements for an educational information system? Let's examine what little evidence we have on use of information in education. The Far West Laboratory for Educational Research and Development ran a survey using both questionnaires and interview of teachers and principals to learn what the respondents wanted from an information service. Remember that this kind of questions is a very difficult thing to ask of a practitioner who has not had access to highly sophisticated information systems. Frequently, what you get from this kind of study is the equivalent of suggestions that the buggy whip be near the gearshift lever. But at the same time, unless you understand what the requirements of the user are, you're not going to be able to design a system which is indeed useful. In rank order, what these people wanted was first of all--information that they could easily get at. That was far and away, the number one requirement. Unless your information system has a close outlet to the user, it's not going to be used. Secondly, they were concerned with currency of information. Clearly, there are many accessible information sources that don't have very much current information. (Remember the yellowed lecture notes from your graduate school days?) The third factor is comprehensiveness. Remember information apathy--somebody who is busy trying to teach kids , or operate a school cannot afford to run to a dozen different information sources, which is all that we can offer today. They must have an

outlet from this vast information system that gives them comprehensive coverage so they don't have to go to a number of sources. Fourth, they want rapid answers when they ask a question; you can't have a system which takes a long time to provide the information required. Fifth, they're interested in making sure that the information has been evaluated so there is some sort of verification of its reliability--although this does not necessarily mean scientific reliability. Sixth (notice that this is not nearly as important as some of the others here) they want thorough documentation. They want to know who did it when, where more information is available, and so forth. And finally, they want flexible products and flexible services. If they come and say "I have a headache" and you say "fine, here's Excedrin" O.K. But if they say, "I think my leg is broken" and you staill say "Fine, here's Excedrin," your system is not going to have much credibility or utility to these people. So, again let me suggest that these requirements as stated by teachers and principals, plus what we have learned from the information science field, suggest than an educational information system must provide a range of products related to user needs. I can't stress that enough--unless the information system systematically draws upon the users to find out about user behavior, characteristics, and requirements, it is in trouble. There must be readily accessible services and there must be the possibility of interpersonal communication--the warm and walking computer terminal. Make sure that you maximize, to the degree which your system allows, inter-personal communication because this is the way educators behave.

What would a system look like, then, that would involve all of this? The system can be described in terms of three kinds of factors: its products, its functions, and its services. Products can be divided into two groups: basic and derived. Basic products are forms of information which are acquired and selected in roughly the format in which they'll be disseminated. For example,

ERIC has as its basic product documents which are collected and not rewritten. Data systems have data as their basic products. A third kind of basic product is referral material--lists of people and places. These are the three basic products which an information system can provide. These things are basic not only in the sense that they are distributed roughly in the form you acquire them, but also in the sense that they allow you to develop a range of more finished or derived materials. Examples of derived products are access tools which allow you to get into the information system (for example, abstracts and indexes). A bibliography is a derived information product, as are interpretative materials such as state-of-the-art papers, which you may prefer to call information analyses, which we'll discuss a little later.

Now let's consider functions of the system. An information system that's going to serve a wide and heterogenous user population, clearly has to acquire materials. I remember a Hungarian friend of mine once telling me that the first instruction in a family recipe for chicken paprikas-, was "first steal your chicken." Well, that's also true in information systems. The chickens to steal are documents, data, and the names of people and places. But acquisition must be coupled with evaluation. Remember the teachers said they wanted this information documented, evaluated,--I'm sure that most of you have heard in the famour computer acronym GIGO--garbage in garbage out. I would submit that in an information system there is even a more disastrous form of GIGO, garbage in and gospel out. So, unless your documents, unless your input is evaluated to make sure it's not redundant, unless you make sure that it is reliable and valid, you're simply going to be providing misinformation, and you're going to be swamping them with excessive material. Another broad function is the range of technical processing functions--I don't want to belabor this too much, but among the things that an information system has to do

is to provide intellectual access through abstracting and indexing maintenance of the files so that it is possible to know where each piece of information is located; and then of course, the search of the file as required is necessary for retrieval of the material. Still another function is that of information analysis, where you attempt to tell people enough so that they do the job properly rather than giving them everything you know. Maybe I can give you an example of this. At the present time, let's assume that we have a superintendent who is either so rational or so demented that he decides he wants to look at evidence of the effectiveness of educational television, before making a decision about whether to have a instructional television program in his schools or not. If he asked of the ERIC Clearinghouse on Media and Technology or some other source, "Tell me what is available about the effectiveness of instructional television?" he'd get 400 separate documents. No matter how rational or how demented that superintendent may be, he can't afford to read 400 documents, and attempt to sift among them before he mades a decision. So, for certain kinds of information functions, you'd better make sure that your information system analyzes information according to user requirements. This doesn't have to be on just a one-to-one basis as demanded. There are ways in which information analysis can have broader utility for many audiences. Basically, there are three kinds of information analysis activities, and they don't necessarily all occur in the same locale. One is what they call the discipline-oriented analysis. That is where you talk about available evidence from the standpoint of psychology or sociology or some other field of academic study. A second kind of information analysis, and one which has a great deal more utility for education in most cases, is the mission oriented analysis, in which you draw together and analyze information according to a consistent viewpoint, from whatever discipline, or fields the original documents may come from and relate it

to a real life problem. This is a kind of thing which is done by the Defense Metals Information Analysis Center. Thirdly, there is something we don't now have in education: a type of analysis that I'd guess you'd call a census bureau, in which data, not documents, are collected on very broad phenomena, like oceanography or metallurgy, or space physics. Where these data inputs are manipulated by computers and by other means, in order to try to extrapolate from the data and to generate hypotheses. We don't have these kinds of census bureau information analysis centers in education yet. Until we solve some definitional problems, where one man's creativity is not necessarily another man's neurosis, as it is today, we're going to have trouble getting that kind of information analysis.

Another system function is dissemination, which provides the user access to documents and other system products. The final system function is user services. Let me reiterate once more that an information system that does not relate closely to user requirements and user characteristics will be of little use and is not worth the money required to support it. It is necessary, therefore, that the system receive continuous feedback from the user on how well he's satisfied with the services provided, whether he feels he needs more information, and a variety of other questions. At the present time, we don't have a single educational information system in this country that is based upon user analysis.

There has been a good deal of exhortation this morning about assuring accessibility of information. Well, how do you make it accessible? First of all, you don't leave the poor teacher or principal out there in solitary elegance with his ERIC Thesaurus, copies of Research in Education, and his microfiche reader. You attempt to relate him to the system in a variety of possible ways, of which one excellent example is the ASSIST Center in Wayne County. The system must provide some way of working with the user to find out what it

is he really wants, what information is really relevant to his needs. Are there time limits in terms of how fast he has to have it? Are there limits on the time periods from which he wants information from? Does he want it going all the way back to the year one, or does he want it over just the past three years? Are there any limitations on the sources of information so far as he is concerned? And what are the pruposes for which he wants the information? This last question is critical because it influences the relevance of the output for the system. Having "negotiated" the query so that the information requirements of the user are clear to both him and to his contact with the system the representative of the information system formulates a strategy for conducting the search of the information file. After conducting the search, the information specialist screens and analyzes the output from the search. He doesn't conduct this screening in order to eliminate materials, since study after study has indicated that no matter how naive the user is, he is a better judge of the relevance of a given document or bit of information to his needs than the most sophisticated information scientist. So this screening and analysis is intended to point up where there are agreements or conflicts in documents provided. At this point, the information specialist is ready to brief his client on the results of the search. This may be over the telephone, face to face, or in writing to let the client know what has been found and to learn whether there is need for additional searches or for referring the client to other sources. The information specialist should use this briefing as an occasion for getting feedback information from the client. This kind of empirical assessment of the program is essential in order to keep growing with the user, because as clients make use of information systems, they become increasingly sophisticated and if you have a sterotype of the user in your mind the effect is going to be to have a system that stands still while the users are growing.

In short, then, using George Grimes' terms, an educational information system should include a management information system which will involve data, statistics on personnel, facilities, costs and other matters that can be used for planning, for accounting, for evaluation and related purposes. We also need a technical information system (I think we're all a little uncomfortable with that term as George indicated) but it is a system which is essentially based upon knowledge rather than data, not necessarily all quantified, and consisting of research and clinical evidence contained in print and other forms and information allowing referral of the client to other sources. One think that I would like to point out about these two--we sometimes like to talk as if we could, with enough resources, construct a monolithic educational information system in which both data and documents would be thrown into some sort of a hopper and all that we would have to do is push the right button and out would come the right mixture of data and documents. I'm sorry--it isn't so. It isn't even so in the private sector. The president of the Auerbach Corporation, said once, two or three years ago, that neither in American industry nor elsewhere in the world does he know of a single combined data and document computerized system that can be used as a complete management control system. There just isn't such a thing. The state-of-the-art is not yet that far developed. I tried to verify this with Dr. Ed Parker, another very competent information scientist who knows education, and he says today, even today, that he doesn't know of a single merged document and data system which is cost beneficial. So about all you can do at this time is go down two roads with separate data based and document systems and then attempt to get some sort of human interface between them, rather than attempting to throw all your data, and all your documents, into one file and think you're going to get anything out of it. You can see, however, that between these two types of systems we do

have the basis for improving educational decision making and educational practices.

Let me state my recurring theme again. In order to have a system that is accessible to the user, and providing a range of products, I would submit that what we need in education in this country is a kind of a multi-level information system. There can be no monolithic system. I think one of the biggest problems we have with regard to ERIC is people believing that the Office of Education sees ERIC as the all-sufficient dissemination instrument, and it can't be that. If ERIC can just be a kind of a scientific memory for education, it becomes a useful indeed, an essential component of multi-level information system. But it can't do the job by itself. And it can't do the job for all users with the kind of products that it can provide. It seems to me that in a multi-level system we must have contact both with the teacher and administrator, through information services like the ASSIST Center, where there can be inter-personal communication and tailoring of information products to the user's requirements, but I would like to stress particularly the importance, of the state education agency in a multi-level information system. Federal funds and systems can accomplish some tasks that could not be handled otherwise. There are local outlets that provide accessible, responsible services that a federal system cannot; but, inbetween is the vital linking role of the state education agency. The state education agency is the natural link, the one between national resources and the local user. Historically, in this country both by tradition and by law, the State education agency has served the role of leadership and advocacy for educational quality. Clearly, this kind of leadership role relates to making sure that the information is provided. Also, through its regulatory functions close the State agency can provide quality control in educational operations. Although the degree to which quality control

or regulatory functions are performed varies tremendously from state to state, the state agency is as close to a quality control organization as there is in education at the present time. The state agency also provides another unique function: it provides staff service to both the state legislature and the state executive. Legislative proposals can and do emerge from state education agencies. Presumably, if an information system is available for internal use, it is easier to provide these kinds of staff services more effectively. So our grand design someday will be: federal problems and other non-government national programs to carry on such functions as technical processing of various sorts, some major acquisition programs, and other activities requiring a national effort; the state in an intermediate role; and local user outlets, which may be at an intermediate district level or in large urban areas, at the local district level. Under this kind of system, then, it would be possible to buck any function up as far as possible into the system to have it performed in a cost-beneficial way, and still have effectiveness of performance, for the user down below.

Well, that gets us then through the questions I proposed to discuss an interminable time in the past. Where do we stand? If you look at these products, services, and functions of the state, local, and national level, I guess we're better off in acquisition of documents and providing access to documents than we are in any other area. This, of course, is because you have ERIC, DATRIX, the School Research Information Service, and (I don't know if any of you have seen it) the Current Index to Journals in Education which provides a monthly index of journal literature in areas of interest to educators. But we're very weak on the kinds of clinical information, if I can use that term, that comes out of state education agencies and local school districts. We are not getting that sort of material into ERIC, nor into the School Research

Information Service of Phi Delta Kappa. This is a place where the state can serve as a very useful collection point, to draw out such documents, screen them, and if they have just local utility, keep them in the state. But if they appear to have some utility at a level beyond the state, rather than dealing with them further, put them into ERIC, or School Research Information Service, so that you don't have to waste your time and energy in trying to carry on technical processing that can be done by national components of the system.

What of data? Actually, in many ways we're weaker on data systems than we are on document systems in education. This is true for a variety of reasons, but there are some promising developments, like the Midwest States Education Information Service and the Integrated Educational Information Service (IEIS).

With regard to information analysis, in the past most of this has been done by professional associations and then usually just for their members and nobody else. We are trying to support an information analysis program in the Research Utilization Branch which ends up in products like the PREP Kits which we send out to state agencies. PREP is the acronym for Putting Research into Educational Practice. This one, for example, is a guide for school administrators and broad members on instructional television facilities. It s backed up by a discussion by a highly competent administrator on financial and other considerations in using instructional televison. We have similar kits coming out in the area of reading--there are four on reading programs that are out now. You'll be seeing some others coming out on bilingual programs and a variety of other topics. The contact for the Michigan State Department of Education is Dr. Charles Ruffing. We provide these materials in camera ready copy to the state agency. The reasons we do this is two-fold, first of all, and most important, we want people to look to the state agency as a primary source of information from research. Secondly, because of printing requirements of the

Joint Committee on Printing and Binding, we would have to go through the Government Printing O--fice and all sorts of things to product these in quantities. The result would be that the information would not be available quickly, so we crank them out in this semi-finished form for the state agency, either to reproduce and pass on if they like, or if they would prefer, we'd be delighted to see them, re-package the information to fit unique state requirements and state constraints. If the state agency wants to take the credit for it itself, and forget about the Office, that's o.k., because we're just interested in getting the information used.

Technical processing--well I think the ERIC system provides a useful procedure that can be used at any level, through its use of controled language and so forth.

Client services provide a rather mixed picture. We have just contracted with the Systems Development Corporation to identify what was going on in information in education. They surveyed more than 2,000, educational agencies and they could find only 397 information centers through all the country, only 397 information centers, that met just two criteria. The first criterion was that the center include at least one of the following functions: reference, bibliography compilation, review preparation, abstracting, indexing, loan (either direct or inter-library), literature searching, or referral service. These agencies only had to have one of those services. And so far as holdings (the second criterion) all they had to do was have some books, periodicals, reports, or a significant ERIC collection. Of the 397, only 126 gave anything like comprehensive coverage, covering all the topics of interest to school personnel. Most of the others were curriculum and material centers, Research Coordinating Units for vocational and technical education information, exceptional education information centers, and other special centers which cover

almost subject that you can imagine. Of the 397, 317 are Title III projects, 31 are state vocational research coordinating units, and only 13 are state education information agencies. Over 190 of these information systems had a knowledge base of less than one-thousand books, journals, and periodicals, and less than 25 had book collections as big as five thousand items. Less than one-half had any reference volumes at all. So, clearly, we're in great need for state level services in this country if we want people to have information for more rational decision making.

Maybe one other area to talk about is what kinds of developmental efforts are underway. I've mentioned the Far West Lab's efforts. MOREL and what it did with its referral and data system is tremendous. The Ohio Education Association has adopted the MOREL system in order to provide information services to Ohio educators. We currently have a contract in the Office with Auerbach Corporation, to identify alternative models for multi-level information systems, and the project staff will probably be talking to you folks. We've contracted with the Oregon State System of Higher Education to look at whether there is some way we can get a state acquisition program going, and we have just contracted with Stanford Research Institute to develop a study design for a continuing user study to assure that future developments are directed toward the real information needs of educators.

Let's consider briefly what needs to be done to improve information transfer. Clearly, there is a need for increased information analysis and we'll put more money into this in the Office of Education, but we need help from other sources, too. We need reports of current practice to share with educators all over the country and this, of course, is a place for the state agency to become involved. We need a systematic way of providing referral materials. We need more research and development and above all we need more manpower.

I would like to leave you with just these thoughts. It's essential that if there is to be a system that really is usable and can be economically feasible, we had better find some way of making sure that we don't fractionate our information services. There are tendencies, in some states, for vocational/technical to go its way, exceptional education to go its way, and the state agency with the rest of its function to go its own way, and the result is a number of incomplete systems which can't really compete either for money or for people. There is a tremendous manpower shortage. Unless we can find some way to have a centralized state system, feeding specialized competent people in exceptional, vocational and other areas and in turn feeding a local or intermediate level information system to serve the users, I think that you're going to find that the dream of having useful information services in education is nothing but a dream--it will never come about. We must have a state system and we must have more local outlets, if we're going to have a system that works.

Two questions remain to be answered about educational information services: who should take leadership, and when can we expect a usable system to be a reality. Well, I can't answer those questions very well, because <u>who</u> can bring off an educational information system, I think, depends on you folks a great deal more than it does on those of us in Washington. And <u>when</u>, that's up to you, too. I've enjoyed meeting with you. Thank you.